REMARKS

Claims 1-5, 7-22 and 28-31 are pending, with Claims 1, 28, and 30 being independent. In this Amendment, Claims 1, 28, and 30 have been amended. All amendments presented herein are being made for reasons of clarity with respect to the specification and drawings, and not for reasons relating to the statutory requirements for patentability.

The Rejections

All of the pending claims stand rejected under 35 USC 103(a) as being unpatentable over combinations of Juliano et al., Manov et al., and Riley. Applicants respectfully traverse all art rejections.

The Cited Art

Juliano discloses a cylindrical nozzle heater having a resistive layer that is applied using the fine line direct writing technique in a circumferentially continuous spiral disposed over the length of the substrate. The dielectric layers and resistive layers of the heater are formed of thick film inks.

Manov discloses a heater formed by a ribbon element sandwiched between two plastic sheets joined together as a unit, where the sheets may be cylindrical, and the ribbon element may exhibit a circumferentially discontinuous pattern. The ribbon element is made from amorphous metallic material, not thick

film ink. The pattern of the ribbon element in Manov allows both ends of the trace to be provided on the same side of the heater.

Riley discloses use of the silk screening technique to apply circuit board patterns onto flat substrates.

The Cited Art Cannot Be Properly Combined

When applying 35 U.S.C. 103 to a claimed invention, the following requirements apply:

(A) The claimed invention must be considered as a whole;

(B) The references must be considered as a whole and must suggest the desirability and thus the obviousness of making the combination;

(C) The references must be viewed without the benefit of impermissible hindsight vision afforded by the claimed invention; and

(D) The standard under which a determination of obviousness is made is the reasonable expectation of success standard.

See Hodosh v. Block Drug Co., Inc., 786 F.2d 1136, 1143 n.5, 229 USPQ 182, 187 n.5 (Fed. Cir. 1986).

Under this standard, the Juliano reference cannot be properly combined with either or both of Manov and/or Riley. As will be set forth fully below, Applicants submit that there is no teaching in any of Juliano, Manov, or Riley to support their combination, and that in fact these references teach away from such a combination. Any attempt at combination impermissibly relies upon the hindsight provided by Applicants' disclosure.

Juliano points out that "the standard screen printing and decal printing processes are not capable of producing a continuous circumferential spiral trace pattern. See column 4, lines 17-19. Juliano further discusses screen printing of nozzle heaters, stating: "[t]his method involves flat ceramic substrates and a printed circuit pattern thereon by means of screen printing." See column 3, lines 23-25. It goes on to further describe how the flat sheet could be wrapped around a tubular object to produce a tubular heating element. "However, it cannot produce a continuous circumferential spiral trace pattern." See column 3, lines 37-38. There is no suggestion that a circumferentially discontinuous pattern would be beneficial for a resistive trace made with ink. Juliano in several places points out the desirability of producing a continuous circumferential spiral trace pattern using thick film ink, and in comparing that to the known art at the time, points out the undesirability of any process or result that would not produce that pattern. Therefore, no teaching or suggestion of using a circumferentially discontinuous trace pattern of thick film ink is found anywhere in Juliano.

Manov has been improperly combined with Juliano to provide the teaching of a circumferentially discontinuous pattern to arrive at the claimed invention. The heater in Manov uses a ribbon element sandwiched between two plastic sheets joined together as a unit, and the sheets may be cylindrical. See column 8, lines 50-53. While the pattern produced by the ribbon is circumferentially discontinuous, it is made from amorphous metallic material, not thick film ink. There is no teaching or suggestion in Manov that such a pattern be formed of thick film ink, or that such a pattern be applied to a non-flat substrate by the silk screening

method. One skilled in the art at the time of the invention would not combine these divergent references to arrive at the claimed invention, nor would there be any motivation to do so. It is suggested in paragraph 3 of the Office Action that the motivation to modify Juliano to produce a discontinuous circumferential pattern as taught by Manov may be found because Manov allows the ends of the trace to be located on the same side of the heater. However, Juliano already provides that feature (see Fig. 3) using two continuous circumferential traces: "The spiral pattern is formed by two parallel continuous circumferential spiral line traces which meet at a 180 degree bend 43 on the opposite end from the starting point. This allows the power terminal pads 50 to be printed on the same end of the heater for easy access of terminal connections." Column 6, lines 23-28. There is no need or motivation for one skilled in the art to apply the discontinuous circumferential pattern of Manov to Juliano, solely to allow the ends of the trace pattern to be located at the same end of the heater. Juliano and Manov cannot be properly combined.

Riley teaches the use of silk screening on flat surfaces to produce electrical circuits. Riley does not teach or suggest silk screening on anything other than flat substrates. Even though the sample shown in Riley is small, it is improper to make the assumption set forth in the Office Action that use of a small sample supports use of silk screening on large non-flat surfaces (apparently based on the reasoning that a large, non-flat surface can be broken down into many smaller flat surfaces). Such unsupported theories of the art are based on the hindsight afforded by Applicants' disclosure. The reality is that there had been no disclosure or suggestion in any of the cited art of silk screening on anything other than flat

substrates at the time the claimed invention was made. To silkscreen onto a non-flat surface would not have been merely a matter of choice for one skilled in the art, as it was a significant deviation from the state-of-the-art at the time the invention was made. "It is difficult but necessary that the decisionmaker forget what he or she has been taught . . . about the claimed invention and cast the mind back to the time the invention was made (often as here many years), to occupy the mind of one skilled in the art who is presented only with the references, and who is normally guided by the then-accepted wisdom in the art." W.L. Gore & Associates, Inc. v. Garlock, Inc., 721 F.2d 1540, 220 USPQ 303, 313 (Fed. Cir. 1983), cert. denied, 469 U.S. 851 (1984). The then-accepted wisdom in the silk-screening art was that silk screening was a technique suited for printing on flat objects. Artistic prints, tee shirts, and printed circuits were all silk screened onto flat materials. Even in Juliano discussion of silk screening involved flat substrates with the silkscreened material being transferred like a decal. Riley teaches the use of silk screening on flat surfaces to produce electrical circuits, and does not teach our suggest silk screening on anything other than flat substrates. It is suggested in the Office Action that motivation existed for one skilled in the art to use the silk screening process on the round substrate of Juliano because it would allow for application of multiple layers of materials. However, Juliano provides for layering of materials in Fig. 6a (column 4, lines 46-48 and column 7 lines 17-18) and also column 6, lines 50-53, where it is discussed that the dielectric material can be applied in several thin layers generated by several passes of the fine film printing head. There is therefore no motivation to combine the teachings of Riley with Juliano.

Accordingly, Applicants request that all rejections based on the improper combination of Juliano and Manov and Juliano and Riley be withdrawn.

The Cited Cases

In re Thorpe was relied upon to support the rejection of the claims on the grounds that the product is the same as or obvious in view of the products shown in the cited art. In re Thorpe involved claims for a process by which two chemical ingredients (metal oxide and carboxylic acid) were added to a mixture, and the two ingredients reacted during the process to produce a metal carboxylate. The prior art process added more expensive pre-reacted metal carboxylate to the mixture. The product-by-process claims were rejected because the end product, in both the claims and the prior art, contained metal carboxylate. The rationale was based on the fact that although the metal carboxylate was not directly added (it was instead produced *in situ*) this difference did not change the end product.

In re Dailey was relied upon to support the assertion that the change from silk screening on a flat surface to silk screening on a non-flat or cylindrical surface is obvious as a mere change in form or shape. In In re Dailey, the court held that the particular configuration of the claimed disposable plastic nursing container was a matter of choice that a person of ordinary skill in the art would have found obvious, in the absence of persuasive evidence that the particular configuration of the claimed container was significant. No evidence was presented that that the shape of the container was in fact significant in any way.

The Cited Cases Are Inapplicable

As will be pointed out below, the heavy reliance in the Office Action on the holdings in In re Thorpe and In re Dailey is misplaced, because legal precedent can provide the rationale to support an obviousness rejection only if the facts in the cited cases are similar to those in the application at hand. The facts in these cases are so remote from those of the present application that it is improper to base the outstanding rejections on their holdings.

For the holding of In re Thorpe to apply to the presently claimed invention, Applicants' claimed heater would have to be the same as the prior art, or obvious from the prior art. The claimed heater has a non-flat substrate on which dielectric layers and a resistive layer are applied by silk screen printing, where the resistive layer has a trace pattern that is discontinuous circumferentially. In contrast, Juliano discloses a cylindrical nozzle heater having a resistive layer that is applied using the fine line direct writing technique in a circumferentially continuous spiral disposed over the length of the substrate. Though the product of the claimed invention and the product of Juliano are both heaters having non-flat substrates with dielectric layers and resistive layers made of thick film inks, the presently claimed invention features a circumferentially discontinuous resistive layer formed by silkscreening, whereas Juliano has a circumferentially continuous spiral resistive layer formed by the fine line direct writing process. Manov and Riley disclose even less related products.

Unlike In re Thorpe, where the claimed process and the prior art process both produced exactly the same end product, here the different processes

produce substantially different end products. The process of producing these heaters, with each having its own distinctive trace pattern, is very much related to the type of pattern produced. The fine line direct writing process produces a continuous spiral pattern. As the substrate is rotated, the pen is advanced along the length of the substrate at a desired rate, much like a lathe, to produce the desired circumferentially continuous spiral pattern. In contrast, the silk screening process deposits a layer of thick film having a discontinuous pattern over the length and circumference of the nozzle, to produce the desired non-circumferentially continuous resistive trace pattern. When the cited art is examined for any suggestion that it would be beneficial to make a heater using a Applicants' disclosed process of silk screening the resistive trace on a non-flat substrate, where the trace has a circumferentially discontinuous pattern, none can be found.

Because the facts of In re Thorpe are so far afield from the facts of the present application, reliance upon In re Thorpe as the basis for the rejection of the claims is improper.

For the holding of In re Dailey to be applicable to the presently claimed invention, it would have to be a mere matter of choice to use silk screening to apply the resistive layer to a flat versus a non-flat surface. However, as discussed above, the shape of the substrate being silk screened is very significant, in direct contrast to the situation presented in In re Dailey. It was well known at the time the invention was made how to silk screen on flat surfaces, but at the time of the invention, it was thought to be extremely impractical or impossible to silk screen non-flat surfaces. Thus, the "matter of choice" of In re Dailey does not apply to the

present case because using a flat or non-flat surface for silk screening was not merely a matter of choice, as one skilled in the art would not have known how to use such a technique. Choosing one of many particular configuration for a nursing bottle in In re Dailey is not an analogous situation. Therefore, reliance upon In re Dailey as the basis for the rejection of the claims is also improper.

Conclusion

Accordingly, in view of the amendments and remarks set forth above, Applicants submit that this application is in condition for allowance, and respectfully request prompt issuance of a notice thereof.

Applicants' undersigned agent may be reached by telephone at (202) 625-3500. All correspondence should continue to be directed to our below listed address.

Respectfully submitted,

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